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THE POLITICAL ECONOMY OF UNDERINVESTMENT IN LDCs

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The Political Economy of Underinvestment in LDCs

by

Jean-Marie Baland* and Ashok Kotwal**

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Preliminary Draft

Abstract

A simple model of political economy is constructed to capture the following view: Owners of sector-specific factors form lobbies and influence the government policy to lighten their own tax burden even if it means a decline in public investment. Since public investment creates benefits also for the mobile factors which are unorganized, its socially optimal level is deemed to be too high by the lobbies. This creates an incentive to siphon off public funds as subsidies. In addition, due to the **Engel's** law the income increases resulting from an increase in public investment cause a decrease in the terms of trade for agriculture. This terms of trade effect makes public investment even less desirable for farmers. Since trade liberalization makes the terms of trade invariant to public investment, it would reduce the extent of under-allocation of public investment. This can be considered an additional gain from trade.

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IRIS Summary

The Political Economy of Underinvestment in LDCs

Jean-Marie **Balland** and **Ashok** Kotwal 1994

There is almost a consensus now that many developing countries have had governments which did too much of what governments should not do and too little of what governments ought to do. Even interventionist governments have underallocated for public investment. In India -- a country known for its interventionist policies, for example, there has been a slowdown or stagnation in public investment accompanied by a rapid growth of subsidies to various organized groups in the society. Some authors, particularly **Bardhan** (1984) have stressed the fact that **the decline in public investment may have been a direct consequence of the rise in subsidies**. It is almost as if the organized lobbies are actively engaged in competing with each other in raiding the public purse.

Our explanation of the phenomenon of under-allocation of public investment is based on **Mancur** Olson's insights and is as follows: **Lobbies form around sector specific factors** and they try to manipulate government policies in such a way that the net returns to sector-specific factors are maximized. Suppose, for example, that an economy consists of two sectors -industry and agriculture, and industrial and agricultural skills are the two sectorspecific factors corresponding to them. Unskilled labor, used by both, can be considered a mobile factor and it tends to remain unorganized. An increase in public investment has three effects in this economy. First, it increases the output and hence the incomes of the owners of the sector-specific factors (lobby members). Second, it increases the **marginal productivity of labor in each of the two sectors and will thus raise the wage in terms of the price of each of the two goods**. Third, it can change the relative prices between the two sectors if the **preferences are nonhomothetic, at least if the economy were insulated from the international economy**. From the perspective of the two lobbies, the first effect makes public investment desirable while the second effect makes it undesirable since higher wages translate into higher costs.

Most interestingly, the third effect also makes public investment undesirable to the organized sectors but the reason for it is quite subtle. Suppose the preferences reflect the **Engel's** law and the income growth resulting from an increase in public investment leads to a **decline in the the relative price of agricultural output -- a development that is in the interests of the industrial lobby but not in the interests of the farm lobby**. Yet, since farmers (as producers) would lose much more from such a decline in the terms of trade than what the members of the industrial lobby (as consumers) would gain from it, the third effect too makes public investment undesirable to the organized part of the economy as a whole. At the socially optimal level of public investment, the marginal social benefit of a dollar of public investment is equated to a dollar. But the marginal social benefit

includes the wage increase as well as the cheapening of agricultural good -- the effects of public investment which are, in fact, regarded as costs rather than benefits by those who are organized as lobbies. The lobbies would thus rather siphon off the marginal dollar as subsidy than leave it in the public purse to be used as investment. They use political pressure to induce the government to fork out more subsidies to themselves although they are fully aware that this would result in under-allocation of public investment.

A direct implication of the above analysis is that any policy measure **which** makes relative prices **invariant** to an increase in public investment, such as trade liberalization or changing quantity restrictions to tariffs, would eliminate the third effect and yield an allocation of public investment that is closer to the socially optimal level. This is a benefit of trade liberalization that is not yet fully recognized.

We believe that the most convenient framework for analysing political economy as resulting from the interactions between various lobbies and the government is the one created by Bernheim and Whinston (1986). **The** government or the policy-maker **is** viewed as a common agent and the lobbies are viewed as principals. Grossman and **Helpman** (1992) used a similar framework to analyze the tariff structure as an instrument for **manipulating prices**. The contribution of the present paper is to suggest that public investment is also an important determinant of relative prices, and thus becomes a relevant instrument in the political game.

1. Introduction

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Our explanation of the phenomenon of under-allocation of public investment is based on **Mancur** Olson's insights and is as follows:

Lobbies form around sector specific factors and they try to manipulate government policies in such **a** way that the net returns to sector-specific factors are maximized. Suppose, for example, that an economy consists of two sectors -- industry and agriculture, and industrial and agricultural skills are the two **sector-**specific factors corresponding to them. Unskilled labor, used by both, can be considered a mobile factor and it tends to remain unorganized. An increase in public investment has three effects in this economy. First, it increases the output and hence the incomes of the owners of the sector-specific factors (lobby members). Second, it increases the marginal productivity of labor in each of the two sectors and will thus raise the wage in terms of the price of each of the two goods. Third, it can change the relative prices between the two sectors if the preferences **are non-**homothetic, at least if the economy were insulated **from** the international economy. From the perspective of the two lobbies, the **first** effect makes public investment

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In the next section we specify a model so designed that the utility of each individual can be related to the level of public investment and taxes incident on him or her. We then characterize the socially optimal level of public investment. In the second section, we model the political economy as interactions between lobbies and the government, and analyze the rationale behind underinvestment by the public sector. In the third section, we analyze the conditions under which trade liberalization, through its impact on public investment, leads to a rise aggregate welfare. Through the first three sections we regard public investment as a common input to both industry and **agriculture**. But in the fifth section, we show that the results are not only not weakened by assuming sector-specific investment but may, in fact, be strengthened. In the sixth section, we use the arguments developed in our paper to speculate on the political economy underlying the course of the Indian development policy. In the concluding section, we review the logic driving our model to examine the robustness of our results.

2. The model

Preferences

All individuals have identical preferences given by:

$$(1) \quad U(x_i, x_a, z) = x_i + u_a(x_a) + u_z(z)$$

where x_i , x_a and z denote **repectively** the amounts of industrial goods, agricultural goods and leisure consumed by an individual agent. It is assumed that $u'_j > 0$, $u''_j < 0$ for $j \in \{a, z\}$.

The quasi-linear utility function is chosen since it enables the use of Bernheim and Whinston's common agency framework in modelling the political equilibrium for the economy. The unrealistic feature of the utility function in (1) **which may cause concern is the fact that the demand for x_a and z are independent** of an individual's income. This aspect of the assumed utility function, however, does not affect the results qualitatively.

The above form also brings out the asymmetry in preferences between the industrial and agricultural goods. The income elasticity for the industrial good is one while that for the agricultural good is zero. This, once again, is an extreme assumption but not crucial to the results. What is crucial for our results is the incorporation of the **Engel's** law; the demand composition should shift in favour of the industrial good as incomes rise. The **Engel's** law leads to a decline in the terms of trade for agriculture as a result of an increase in public investment. Such a terms of trade effect plays an important role in our results. In reality, the rich and the poor spend their money quite differently. The income elasticity for food is low for the rich and is high for the poor. But even in a poor country if the income distribution is sufficiently unequal we should expect to see a decline in the terms of trade for agriculture as the aggregate income rises. The preferences we have assumed yield such an outcome.

Endowments

Each individual is endowed with one unit of time which he or she can allocate between leisure and work. The work for specific factor owners involves entrepreneurial or management activity; for the rest (i.e., the workers) it is a **labouring** activity. The entrepreneurial input in each sector can be taken as a proxy for private investment in that sector. The specific **factor** in industry can be the skill or human capital specific to that sector. For the sake of expositional convenience, it is assumed that the distribution of ownership is uniform within each sector and that there is no cross-ownership across sectors.

Production

Each sector is characterized by a competitive structure; there are many producers in each sector who maximize their utility taking the prices as given. In other words, a producer in sector j solves:

$$(2) \quad \text{Max}\{p_j x_j(k_j, e_j, \ell_j, G) - w\ell_j - p_a x_a + u_a(x_a) + u_z(1 - e_j)\}$$

Note that x_j, k_j, e_j and ℓ_j are respectively the levels of output, specific factor, entrepreneurial input and unskilled labor in the production of good j . G is the level of **public good (infrastructure)** and w is the market wage. The function $x_j(.)$ is such that $\frac{\partial x_j(.)}{\partial(.)} > 0$, $\frac{\partial^2 x_j(.)}{\partial(.)^2} < 0$. We also, assume that public investment, G , is complemenatry to all other inputs : $\frac{\partial^2 x_j(.)}{\partial(.)\partial G} > 0$. The industrial good is taken as the numeraire and hence $p_i = 1$. The price of x_a is denoted by p_a .

This characterization of the structure of production is not compatible with the actual industrial structures in LDCs where monopolistic public or private enterprises with organized **labour** are the norm. The organized **labour** is often successful in increasing their incomes by staking claim to the rents of specific factors. For the process we want to model, we may consider the members of organized **labour** as co-owners of industrial capital. An alternate way to model the **industrial sector is to view the industrial enterprises as producer co-operatives**. This, however, would introduce complications which are extraneous to the political process we want to model without altering the results obtained. We regard all those who are recipients of rents on industrial capital as industrial entrepreneurs and those who are not (casual workers, workers working for the sub-contractors) as workers.

Public Finance

The government collects a per-person tax t_j from an individual of class j where $j \in \{i, a, \ell\}$. Thus t_i , t_a and t_ℓ are the per-person taxes from industrial producers, farmers and workers (providers of unskilled labor) respectively. Let \bar{t}_j be the maximal tax which can be imposed on an agent of class j . The total net tax revenue collected by the government is given by:

$$(3) \quad \mathbf{T} = n_i t_i + n_a t_a + n_\ell t_\ell,$$

where n_i , n_a **and** n_ℓ are the numbers of individuals belonging to the three classes : industrial producers, farmers and workers.

As explained in the Introduction, the political lobbies, once formed, try to **arrange income transfers to themselves from the public revenues through** a variety

of subsidy demands.. The marginal effects of changes in income subsidy work exactly like a marginal change in income-tax. The attempt to influence the government to increase subsidies to a lobby is equivalent to an attempt to lower the net tax burden on the lobby members.

Typically the lion's share of the total tax revenues collected in **LDCs** is in the form of indirect taxes. In Section 6, we will show that our results go through when we change to an indirect tax system. However, indirect taxes will introduce disincentive effects and we have chosen to communicate the main logic underlying the phenomenon of under-allocation of public investment with a distortion free tax system.

The government spends the entire tax-revenue on the public good G . In reality, there are two kinds of public goods : (i) sector-specific public goods like irrigation or urban infrastructure, and (ii) general infrastructure like transportation and communication network which increase the productivity of factors in both sectors. We have chosen here to model the case of a general public good though, as we will see at Section 4 below, the analysis can easily be extended to sector-specific public goods.

For simplicity, we will assume that the public good is produced linearly using industrial goods only requiring one unit of industrial good to produce one unit of public good¹. Since the industrial good is also the numeraire good, the government's budget constraint can be written down as:

$$(4) \quad G \leq n_i t_i + n_a t_a + n_l t_l$$

¹The particular function chosen to represent the production process of the public good does not affect the results. Note that as public investment consists only of industrial goods, the industrial lobby may want to inflate public expenditures since it increases the demand for its own products. As we shall see, however, the equilibrium level of public investment is, in spite of this, too low to be socially optimal even if the industrial sector is organized .

Note that we use the terms public investment and public good interchangeably since our model is only a one-period model. If the government chooses the taxes t_i , t_a and t_ℓ , the level of public investment is thereby determined. For a given level of G , the producers in industry and agriculture choose their own entrepreneurial inputs (e_i, e_a) ; this is meant to capture the positive response of private investment to the improvement of infrastructure. The producers also decide on the labour demand while the consumers decide on the demand for x_i , x_a and z . The general equilibrium system is thus completely specified for a given choice of the taxes by the government. The government's choice, however, has yet to be endogenized.

Socially Optimal Level of Public Good

As a base-case, let us examine the level of public good in a closed economy if the government were a benevolent dictator. It would then choose t_i , t_a and t_ℓ to solve the following problem:

$$(5) \quad \text{Max}_{G, \hat{t}} \{ \Omega_i(G, \hat{t}) + \Omega_a(G, \hat{t}) + \Omega_\ell(G, \hat{t}) \}$$

where Ω_j denotes the aggregate welfare of all individuals of type j and \hat{t} is the vector of tax rates, i.e., $\hat{t} = \{t_i, t_a, t_\ell\}$. Let us denote the aggregate social welfare function for the society as Ω_A .

Thus,

$$(6) \quad \Omega_A = \Omega_i + \Omega_a + \Omega_\ell.$$

Since the aggregate welfare of a class (say farmers, i.e., $j = a$) is made up of summing up the individual utilities of n_a farmers:

$$(7) \quad \Omega_a = n_a \{ [I_a - p_a d_a - t_a] + u_a(d_a) + u_z(d_z) \}$$

where I_a is the income and d_a and d_z are the demands for the agricultural good and for leisure. by an individual farmer.

For a given set of values for t_i and t_ℓ , how is the aggregate welfare of the farmers' class-affected by a change in t ?

$$(8a) \quad \frac{d\Omega_a}{dt_a} = n_a \left\{ \left\{ p_a \frac{\partial x_a}{\partial G} + (x_a - d_a) p'_a(G) - \ell_a \cdot w'(G) \right\} - 1 \right\}$$

An increase in t_a expands the budget enabling a greater amount of public investment to be financed causing an increase in the output and hence in the revenues of the farm sector. This is represented by the first term in the curly brackets, ' $p_a \frac{\partial x_a}{\partial G}$ '. The increase in the agricultural output, however, causes a decline in the price of agricultural product p_a ; this terms of trade effect is a direct consequence of the preference structure that is constructed to reflect the **Engel's** law. Since each farmer produces more than he consumes, (i.e. $x_a - d_a > 0$), this decline in p_a causes a decline in farmers' welfare. This is captured in the second term ' $(x_a - d_a) p'_a(G)$ '. This terms of trade effect is instrumental in the results presented later. The increase in the public investment also increases the labor demand in the economy causing an increase in wages and hence in the **farmers'** production costs. This is captured in the third term ' $-\ell_a \cdot w'(G)$ '. The fourth term '-1' is the loss in farmers' utility resulting **from** the lowered consumption of x_i caused by a higher tax.

Analogously, the marginal effects of an increase in ' t ,' on the welfare of the other two classes in the society can be written down as:

$$(8b) \quad \frac{d\Omega_i}{dt_a} = n_i \left\{ \frac{\partial x_i}{\partial G} - d_a p'_a(G) - \ell_i w'(G) \right\}$$

$$(8c) \quad \frac{d\Omega_\ell}{dt_a} = n_\ell \left\{ -d_a p'_a(G) + (\ell_a + \ell_i) w'(G) \right\}$$

Summing up the aggregate welfare across the three classes,

$$(9) \quad \frac{d\Omega_A}{d\mathbf{x}} = \left\{ \left[n_a \cdot p_a \frac{\partial x_a}{\partial G} + n_i \frac{\partial x_i}{\partial G} \right. \right. \\ \left. \left. + [n_a x_a - (n_a + n_i + n_\ell) d_a] p'_a(G) + [(\ell_a + \ell_i) - (\ell_a + \ell_i)] w'(G) \right\} n_a - n_a$$

In equilibrium, the price effects introduced by the second and the third square brackets wash out as the benefits of price increases according to the suppliers are exactly cancelled by the costs borne by the demanders. Thus, $\frac{d\Omega_A}{dt_a}$ reduces to:

$$(10a) \quad \frac{d\Omega_A}{dt_a} = \left\{ n_a p_a \frac{\partial x_a}{\partial G} + n_i \frac{\partial x_i}{\partial G} \right\} n_a - n_a$$

Similarly,

$$(10b) \quad \frac{d\Omega_A}{dt_i} = \left\{ n_a p_a \frac{\partial x_a}{\partial G} + n_i \frac{\partial x_i}{\partial G} \right\} n_i - n_i, \text{ and}$$

$$(10c) \quad \frac{d\Omega_A}{dt_\ell} = \left\{ n_a p_a \frac{\partial x_a}{\partial G} + n_i \frac{\partial x_i}{\partial G} \right\} n_\ell - n_\ell$$

where $N = n_i + n_a + n_\ell$.

Rewriting equations (10), one obtains the first-order condition for social optimality :

$$(11) \quad n_a p_a \frac{\partial x_a}{\partial G} + n_i \frac{\partial x_i}{\partial G} = 1$$

The marginal social benefit is given by the marginal revenue product of the public investment. The marginal cost of public investment is equal to **1**. Note that the optimality condition uniquely defines the optimal G but not t_i , t_a and t_ℓ . Any allocation of the tax-burden across the three classes may be used to finance the optimal level of public investment. This **indeterminacy** results from the **quasi-linear** form of the utility function and the form of taxation, namely the direct **per-person income tax**. **The total income appears in an additively separable manner in the aggregate welfare function and hence it does not matter how the total tax-burden is allocated.**

Our next task is to create a framework to model political economy so that the government decisions could be endogenized.

3. The Political Equilibrium

Common Agency as a Framework for Modelling Political Economy

We will adopt the framework used by Grossman and **Helpman** (1992) who, in turn, have drawn on the work of Bernheim and Whinston (1986) (see also Becker (1983) and Spiller (1990)). Producer groups linked by the common interest of maximizing the rents on their sector-specific factors organize themselves into political-pressure groups or lobbies with the intent of influencing government policy. The government may be viewed as a common agent and the lobbies as a number of principals attempting to influence the agent's actions (in setting policy) by offering a

menu of pay-offs (bribes) (denoted by A in Grossman and Helpman) related to the policy variables.

Adapting this framework to our model, we can state the problem as follows: once a producer group j , whether farmers or industrialists, gets organized as a lobby, it announces a contribution schedule Λ_j to the government. This contribution schedule maps the policy vector $\hat{t} = \{t_i, t_r, t_\ell\}$ into a number indicating a sum of money that the government would receive as a contribution. These contribution functions are assumed to be differentiable functions.

The government is assumed to maximize an objective function which is a convex combination of contributions summed across all lobbies and the social welfare.

$$(12) \quad \sum_{j \in L} \Lambda_j(\hat{t}) + \alpha \Omega_A(\hat{t})$$

where L is the set of all groups which have organized themselves into lobbies. According to Lemma 2 of Bernheim and Whinston (1986) (or Proposition B-W in Grossman and Helpman (1992)) a subgame perfect Nash equilibrium $(\{\Lambda_j^0\}_{j \in L}, \hat{t}^0)$ of the public policy game is characterized by the following necessary conditions:

- (a) Λ_j^0 is feasible for all $j \in L$
- (b) \hat{t}^0 maximizes $\sum_{j \in L} \Lambda_j^0(\hat{t}) + \alpha \Omega_A(\hat{t})$ on T .
- (c) \hat{t}^0 maximizes $\Omega_j(\hat{t}) - \Lambda_j^0(\hat{t}) + \sum_{j \in L} \Lambda_j^0 + \alpha \Omega_A(\hat{t})$ on T .

where T is the set of tax rate vectors which the government may choose.

Conditions (a) and (b) are self-explanatory, Condition (c) needs an explanation. It states that in the Nash equilibrium the joint net welfare of the

government and each lobby taken one at a time should be maximized. If this were **not so and the joint welfare of a lobby and the government could be improved upon** by moving to another tax-vector, say \hat{t}^* , the lobby could induce the government to move to \hat{t}^* and mop-up most of the surplus. The tax vector \hat{t}^0 , therefore, could not be sustained in equilibrium. Condition (c) is instrumental in deriving the results that will follow. One should also note that the equilibrium defined by conditions (a)-
(c) above (plus a technical one) has an interesting property in that it is 'coalition-
 proof : this last property implies that, under this equilibrium, the two lobbies cannot do better by cooperating together in a joint attempt to **influence** government's policies.

The first-order condition corresponding to Condition (b) is :

$$(13) \quad \sum_{j \in L} \nabla \Lambda_j^0 + a \nabla \Omega_A = 0$$

Condition (c) yields:

$$(14) \quad \nabla \Omega_j - \nabla \Lambda_j^0 + \sum_{j \in L} \nabla \Lambda_j^0 + a \nabla \Omega_A = 0$$

From (14) and (15), one gets:

$$(15) \quad \nabla \Omega_j = \nabla \Lambda_j^0, \text{ and}$$

$$(16) \quad \nabla \left(\sum_{j \in L} \Omega_j \right) + a \nabla \Omega_A = 0$$

Equation (16) can be expressed as

$$(17) \quad \nabla \sum_{j \in L} \Omega_j (1+a) + \nabla \sum_{k \in -L} \Omega_k \cdot a = 0$$

As can be seen, equation (17) corresponds to the first order condition of the maximization of the following objective function: $\Omega_j + a\Omega_A$. In other words, under a political equilibrium, the government acts as if it is maximizing a weighted sum of the welfare of the different members of the society ². The members of a lobby receive a higher weight $(1+a)$ on their gross welfare than members of unorganized groups.

Such a weighted objective function has been used in similar contexts. For instance, Long and Vousden (1991) assume that the government maximizes a political support function which is made of the sum of differently weighted welfares of the various classes of the economy. However, as Grossman and Helpman (1992) have explained, the fruitfulness of adopting the framework created by Bernheim and Whinston (1986) is precisely in allowing us to endogenously yield such a weighted welfare function as the result of non-cooperative interactions between the various lobbies. Alternatively, we could have just assumed the political support function proposed by Long and Vousden and come up with the results that follow. In fact, the only task that the common agency framework performs for us here is to offer a convincing rationale for generating an objective function maximizing which is equivalent to solving for political equilibrium.

Political Equilibrium with a Single Lobby

Let us first consider the case where only the agricultural sector has organized itself into a lobby. First, remember that since income appears in an additively separable manner in the utility function, transferring a dollar from one individual

²If all sectors in the economy, including the workers in our framework, are organized as lobbies, then one can easily see that the political equilibrium is socially optimal (see Bernheim and Whinston, 1986). It should also be clear from the above that the analytical framework developed here can be applied to any number of lobbies. One should note that it does not qualitatively change the results described below if instead of the same a for all lobbies, one allows for different a_j to be attached to the different lobbies. But then once again we would be introducing exogenous elements in the formation of political influence.

to another in the society leaves the social welfare function (assumed to be Benthamite) **unchanged. This is why any allocation of the tax burden across the** different groups is consistent with the social optimum as long as the level of public investment is optimal.

Consider the case in which the only organized group is agriculture. The agricultural lobby is able to induce the government to tax the other two groups to the **maximum feasible level. As a result, in the political equilibrium, the amount of** taxes collected by the state from these two groups is always equal $n_i \bar{t}_i + n_\ell \bar{t}_\ell$. If G° stands for the political equilibrium level of public investment, then, one can write :

$$(18) \quad n_a t_a^\circ = G^\circ - n_i \bar{t}_i - n_\ell \bar{t}_\ell.$$

If G° is smaller than $n_i \bar{t}_i + n_\ell \bar{t}_\ell$, t_a° is negative, and the political equilibrium involves net transfers to the agricultural producers.

Starting from a situation where public investment is set at the socially optimal level, increasing G by one unit has three effects. First, as long as the **marginal productivity of the public good is positive, the output of the two sectors** rises. Second, with the rise in agricultural output, the relative price of agricultural goods declines; this could be considered a manifestation of the **Engel's** law. The third effect of public investment, detrimental to the farmers' welfare, is the increase in wages caused by an increase in **labour** demand. Farmers' profits decline as the production costs rise. Whether this last effect is empirically significant or not would depend a great deal on the utility of leisure function 'u,(z)' which generates the **labour** supply function. In a poor, labor abundant country, there is a great deal of underutilized labor, and we should expect the terms of trade-effect of an increase in public investment to be much more prominent than the wage effect.

At the social optimum, only the first effect is compared to the cost of public investment since the two other effects are basically transfers among different classes of the society. In the political equilibrium, however, the welfare of the agricultural lobby receives greater weight and thus the two other effects, the terms of trade effect and the wage effect, are also taken into account, lowering the marginal benefit of public investment to the state. Furthermore, since the industrial sector is unorganized the marginal benefit of public investment through an increase in industrial output also receives a lower weight. On the other hand, the cost of public investment remains unchanged. As a consequence, the government will reduce public investment and transfer the savings to farmers.

Another way to think about it is to recognize that the organized sectors receiving greater weight on their welfare **is** exactly **analogous to the unorganized** sectors receiving less weight on theirs. Formally speaking, the first order condition for the political equilibrium (Equation 17) can be rearranged and expressed as:

$$(19) \quad \left\{ (1+a) \frac{d\Omega_A}{dt_a} - \left[\frac{d\Omega_i}{dt_a} + \frac{d\Omega_f}{dt_a} \right] \right\} = 0$$

Since at the social optimum (i.e., at $G=G^*$), $\frac{d\Omega_i}{dG} = \frac{d\Omega_i}{dG} n_a > 0$ and $\frac{d\Omega_f}{dG} = \frac{d\Omega_f}{dG} n_a > 0$, the LHS of Equation (19) is negative. Since Ω_A is concave in G , it must be that G which satisfies (19), say G^* , is smaller than G^* . This leads us to the following proposition :

Proposition 1: *If the only organized group in the society is 'farmers', the level of public investment in political equilibrium is always lower than the social optimum .*

Since the entrepreneurial effort provided by farmers is complementary to **public investment, it goes without saying that under such a political equilibrium** there would be a further reason to have too little agricultural output produced. In fact, since farmers' efforts respond to public investment, keeping public investment sub-optimal serves the purpose of coordinating a competitive sector to a low level of output.

It may be noted that if only a few farmers produce all the agricultural output, i.e., if n_a is small, the LHS of Equation (19) is even more negative and correspondingly G^* is even smaller. In other words, in an economy controlled by a **small but powerful** landed oligarchy the extent of under-allocation of public **investment will be even greater and the characteristics of a backward economy such** as an underdeveloped infrastructure will persist even longer.

It is useful to note here that in the above analysis the savings in public expenditures obtained through a reduction in public investment are entirely transferred as subsidies to the agricultural producers. One could however consider **another situation under which $G^* < n_i \bar{t}_i + n_l \bar{t}_l$, and $t_i, t_l > 0$.** As a result, in the political equilibrium, the agricultural lobby is able to make the rest of the economy bear the entire tax burden but any reduction in the level of public investment does not translate into transfers to its own members. Algebraically speaking, the -1 term on the RHS of Equation (8a), which represents the opportunity cost (under the form of foregone transfers) to the lobby, disappears. Is it possible that the farmers could object to a greater allocation for public investment even when they do not have to pay for it? In other words, are there plausible conditions under which $\frac{\partial \Omega_a}{\partial G} < 0$?

As discussed earlier, public investment has three major effects on the farmers : an output effect, a terms of trade effect and a wage effect. Leaving aside the wage effect, a characteristic that is more likely to be true of the agricultural sector than it

is of the industrial sector is that the terms of trade effect given by $(x_a - d_a)p'_a(G)$ is large enough to overwhelm the output effect given by $p_a \frac{\partial x_a}{\partial G}$. Indeed, the market equilibrium in the agricultural good sector is given by:

$$(20) \quad D(p_a) = S(p_a, G).$$

Totally differentiating both sides of (20) with respect to G , and rearranging the terms:

$$(21) \quad \frac{dp_a}{dG} = \frac{S_G}{(D' - Sp_a)} = \frac{n_a \frac{\partial x_a}{\partial G}}{(D' - Sp_a)},$$

Using (21), it is easy to show that

$$p_a \frac{\partial x_a}{\partial G} + (x_a - d_a) \frac{dp_a}{dG} < 0 \quad \text{if}$$

$$(22) \quad \epsilon_S - \epsilon_D < 1 - \frac{n_a}{N}$$

where ϵ_S and ϵ_D are the supply and demand elasticities (price) of the agricultural good. The right hand side of (22) represents the fraction of the population that belongs to the two other groups • industrial producers and workers. It is fruitful to get **some idea of how plausible condition (22) is.**

The supply elasticities of individual crops in India fall in the range of .3 to .7 [de Janvry and Subbarao (1986)]. For agricultural sector as a whole the supply elasticity would be much lower. Suppose it is .2, as estimated in recent study by Binswanger, Khandker and Rosenzweig (1993). Similarly, the demand elasticity for **the composite output of agricultural sector would be much lower than for individual**

crops. Once again .2 would be a reasonable number. If the agricultural producers **with marketable surplus form only 60% of the population, it would mean that the** price effect would more or less completely cancel the output effect of public investment.

In general, the condition (22) may or may not be quite satisfied for poor countries. Poor people may have low supply elasticities but have high demand **elasticities, and what part of the population constitutes the surplus farmers class** depends on the distribution of land-holdings. In an egalitarian less developed **country it is less likely that Condition (22) would be satisfied than it is for an** inequalitarian one. In a developed country, on the other hand, Condition (22) would be satisfied almost as a rule. It is not a surprise, therefore, that farmers in developed countries are often on the lookout for output-lowering policies rather than output-increasing ones.

Consider now the case where only the industrialists are organized. An important difference with the case analyzed above is that, the industrial lobby actually benefits from the fall in agricultural prices as a consumer of agricultural goods. Moreover, an increase in public investment increases demand for the industrial good since it is an input to it. Would there be under-allocation of public investment under the circumstances?

The political equilibrium is characterized by

$$(23) \quad \frac{d\Omega_i}{dt_i} + a \frac{d\Omega_A}{dt_i} = 0$$

But at the socially optimal level of public investment ($G=G^*$), $\frac{d\Omega_i}{dt_i} < 0$ if $\frac{d\Omega_a}{dt_i} + \frac{d\Omega_e}{dt_i} > 0$. It can be easily verified that

$$(24) \quad \frac{d\Omega_a}{dt_i} + \frac{d\Omega_t}{dt_i} = n_a p_a \frac{\partial x_a}{\partial G} + n_i d_a p'_a(G) + n_i \ell_i w'(G)$$

Since $w' > 0$, a sufficient condition for the RHS of (24) to be positive is:

$$(25) \quad n_a p_a \frac{\partial x_a}{\partial G} + n_i d_a p'_a(G) > 0$$

Using (22), this condition can be reduced to a condition relating the supply and demand elasticities in agriculture and the relative size of the industrial class:

$$(26) \quad \epsilon_s - \epsilon_D > \frac{n_i}{N}$$

Using the elasticity estimates used earlier, one can safely conclude that as long as the industrialists do not represent more than 40% of the population (an unrealistically high figure), the equilibrium level of public investment would be below the social optimum. The discussion above is summarized as Proposition 2 below :

Proposition 2 : *When the industrial sector is the only organized sector, the level of public investment allocated under political equilibrium is lower than socially optimal, if Condition (26) is satisfied.*

We have just seen that the terms of trade effect is beneficial to the industrialists and detrimental to the agricultural sector. Furthermore, in a developing economy, we expect the industrial labour force to be much smaller than the agricultural labor force, and therefore, the wage effect should affect more strongly the agricultural sector than the industrial sector. As a result, one may

conjecture that a developing economy in which the only organized sector is industry **is likely to develop better infrastructure than an economy in which the only** organized sector is agriculture. Typically, when the only lobby in the economy consists of the industrial sector, we should expect to see the farmers and workers squeezed under exploitative taxation but a fair level of infrastructural development **activity** compared to predominantly agrarian economies.

Political Equilibrium with Two Lobbies

Let us now consider the case where both industry and agriculture are **organized as lobbies. At the equilibrium**, the organized lobbies induce the government to impose a maximum tax on the third sector, the 'workers', so that $t_l = \bar{t}_l$. Moreover, workers always benefit from an increase in public investment as it (1) increases the aggregate demand for **labour** and, hence, the wage rate, and (2) lowers the relative price of agricultural goods. Since the benefits of public investment spill over onto the unorganized sector, in the political equilibrium, the two lobbies internalize only a part of the marginal benefits associated with an **increase** in public investment while they bear the entire marginal costs for it (in terms of increased net taxes or in terms of foregone transfers and subsidies). As a result, **the equilibrium level of public investment is sub-optimal. This is captured in** Proposition 3 :

***Proposition 3:** When both agriculture and industry are organized, the equilibrium level of public investment is always lower than the social optimum .*

Proof: The first order condition for political equilibrium can be rewritten in the present context as $(1+a) \frac{d\Omega_A}{dt_a} - \frac{d\Omega_\ell}{dt_\ell} = 0$. The first-order conditions for the

equilibrium level of public investment can therefore be written as :

$$(27a) \quad \{1+a\} \left\{ \left[n_a p_a \frac{\partial x_a}{\partial G} + n_i \frac{\partial x_i}{\partial G} \right] n_a - n_a \right\} - \{n_\ell [-d_a p'_a(G) + (\ell_a + \ell_i) w'_c(G)] n_a\} = 0$$

$$(27b) \quad \{1+a\} \left\{ \left[n_a p_a \frac{\partial x_a}{\partial G} + n_i \frac{\partial x_i}{\partial G} \right] n_i - n_i \right\} - \{n_\ell [-d_a p'_a(G) + (\ell_a + \ell_i) w'_c(G)] n_i\} = 0$$

As discussed above, the marginal value of public investment for the workers is always positive : $-d_a p'_a(G) + (\ell_a + \ell_i) w'_c(G)$ is positive for all positive values of G . Moreover, at G^* , the first curly bracket of the R.H.S. of equations (27) vanishes since it corresponds to the first-order conditions for the social optimum. Therefore, at the social optimum, the marginal value in terms of the political objective function of public investment is negative:

$$(1+a) \frac{d\Omega_A(G^*)}{dt_j} - \frac{d\Omega_\ell(G^*)}{dt_j} < 0, \text{ for } j = a, i. \text{ Furthermore, } \Omega_A \text{ is a concave function of}$$

G and hence of t_j . In other words, the second derivative

$$\frac{d^2 \Omega_A(G)}{dt_j^2} = p_a \frac{\partial^2 x_a}{\partial G^2} + \frac{\partial^2 x_i}{\partial G^2} \frac{dp_a}{dG} \frac{\partial x_a}{\partial G} < 0, \quad \forall G > 0, \quad j = a, i. \text{ Therefore, the marginal}$$

value in terms of the political objective function of public investment is negative for all $G > G^*$:

$$\{1+a\} \left\{ \left[n_a p_a \frac{\partial x_a}{\partial G} + n_i \frac{\partial x_i}{\partial G} \right] n_j - n_j \right\} - \{n_\ell [-d_a p'_a(G) + (\ell_a + \ell_i) w'_c(G)] n_j\} < 0, \quad \forall G > G^*, \quad j = i, a.$$

The political equilibrium must therefore be lower than the social optimum :

$$G^\circ < G^*.$$

Q.E.D.

Proposition 3 may suggest some interesting interpretations of patterns of historical evolution. In particular, if an economy is predominantly agrarian and if the aggregate supply and demand price elasticity are low, so that conditions (22) and (27) above are both satisfied, the evolution of an organization of farmers' in a

political arena so far dominated by an industrial lobby must lead to a decrease in the allocation for public goods. Interestingly, many late industrializing countries have gone through a sequence of political evolution whereby a modern industrial sector is first artificially promoted by the State through protection from international competition in the midst of an agrarian economy. The industrial sector organizes itself into a lobby which tries to protect its market rents. Farmers, diffused and numerous, have a more difficult time in getting politically organized. But as long as they are not organized, they bear a disproportionate share of financing for the infrastructural development. This creates incentives for them to be organized. Once they are organized, they try to induce the government into granting them many subsidies even though this drain on the public revenues reduces public investment. Propositions 1, 2 and 3 above explain this pattern. They may also suggest some possible answers relative to the post-independence development history of India. For instance, **Bardhan** (1984) asked the following question: why did South Korea which also had an interventionary state have a faster growth rate through 70' • 80's while India did not? He wonders if this was not due to the fact that in India there were three politically powerful lobbies while in South Korea, there emerged only one • namely, industry.

4. The Open Economy

The main reason why the agricultural lobby would want to see the level of public investment below the socially optimal level is that it reduces the price of the agricultural good and thus reduces the marginal benefits to the members of the agricultural lobby below what they might have been. The deterioration of the internal terms of trade against the agricultural sector can thus be viewed as an

important factor instrumental in keeping the level of public investment lower than what is socially desirable.

This negative terms of trade effect is a direct consequence of the economy being a closed economy. If the economy operated as a small, open economy, the relative prices would be fixed at the world prices and the terms of trade effect would not obtain. As a matter of fact, in an open economy with two lobbies, the first order condition for the political equilibrium level of public investment becomes :

$$(28) \quad \left\{ n_a p_a \frac{\partial x_a}{\partial G} + n_i \frac{\partial x_i}{\partial G} \right\} - n_j \left\{ -\left[n_\ell [(\ell_a + \ell_i) w'_\ell(G)] n_j \right] \right\} = 0, \quad j = a, i.$$

Comparing the above equation with equation (27), one can see that trade liberalization has two effects on the first-order conditions of the political equilibrium. First, as explained above, the terms of trade effect vanishes since the economy now operates at given international prices. Second, under an open economy, the sensitivity of wages to public investment can be different from that under a closed economy. Therefore, it is clear from equations (27) and (28) that, with the industrial and agricultural groups both organized as lobbies, there would be less under-allocation of public investment under an open economy than under a closed economy if the terms of trade effect is much stronger than the wage-effect.

In our view, many developing economies are labor-abundant economies in which the wage-effect is likely to be much smaller than the terms of trade effect. In such economies, labor is sufficiently under-utilized and so its supply is sufficiently elastic to wage increases to prevent large increases in wages in response to an increase in the public investment. Low supply and demand elasticities on the other hand can result in a significant terms of trade effect. We believe, therefore, that liberal trade policies can have a significant positive impact on public investment which, in turn, has a direct positive effect on the well-being of the unorganized and typically the poorest class in the society. This is an important and unrecognized

aspect of the gains from trade. It works through taking away the capacity of organized lobbies to manipulate the relative prices in their favour³.

One can reformulate the above argument in a stark way by making the following assumption: assume that, besides the industrial and the agricultural sectors, there is a third sector, called informal sector, which uses a backstop technology to produce industrial goods. In such a case, as long as the labour force in the backstop sector has not been fully absorbed by the other two sectors, the wage rate in the economy is fixed in terms of industrial goods. As a result, the wage effect w' disappears from the first order conditions of the political equilibrium level of public investment under a closed and an open economy. Under such conditions, we are able to formulate the following proposition :

***Proposition 4:** Under the backstop technology assumption, trade liberalization would lead to a socially optimal level of public investment in an economy with two lobbies.*

5. Sector-specific Public Investment

So far, we have focussed our attention on a general public good which enters symmetrically into the two production functions. However, it is clear that many public investments are sector-specific in the sense that they have productive effects in only one of the two sectors. In the agricultural sector, one may think of public

³It is important to note here that the change in the internal terms of trade could have resulted from almost any non-homothetic preference structure (except, perhaps, the homothetic one provided public investments have similar productive effects in all sectors of the economy) and does not depend upon the quasi-linearity of the preferences.

irrigation facilities, anti-erosive program, agro-economic research and extension services, bio-medical services, rural roads and electrification,. . .

Instead of considering an **undifferentiated** public good, G , let us assume that there are two different types of public goods, G_i and G_a . The production function in each sector and the government's budget constraint then become :

$$(29) \quad x_j = x_j(k_j, e_j, \ell_j, G_j), \text{ with } j = a, i, \text{ and,}$$

$$(30) \quad G_a + G_i = n_a t_a + n_i t_i + n_l t_l.$$

Consider first a closed economy with a single dominant agricultural lobby. By **appropriately modifying the expressions derived in Section 3, one obtains the** following first-order conditions for G_i and G_a :

$$(31) \quad \frac{d\Omega_a}{dG_a} + a \frac{d\Omega_A}{dG_a} = 0 = \left\{ n_a \left\{ p_a \frac{\partial x_a}{\partial G_a} + (x_a - d_a) p'_a(G_a) - \ell_a \cdot \frac{\partial w}{\partial G_a} \right\} - 1 \right\} \\ + a \left\{ n_a p_a \frac{\partial x_a}{\partial G_a} - 1 \right\}$$

$$(32) \quad \frac{d\Omega_a}{dG_i} + a \frac{d\Omega_A}{dG_i} = 0 = \left\{ -n_a \ell_a \cdot \frac{\partial w}{\partial G_i} - 1 \right\} + a n_a \left\{ n_i \frac{\partial x_i}{\partial G_i} - 1 \right\},$$

where, for the ease of interpretation, we have implicitly assumed that $G_i + G_a = n_a t_a$

In other words, the marginal unit of public investment is financed by the agricultural sector . As one can see, equation (31) is analog to equation (19). The **political equilibrium is also characterized by a sub-optimal level of public** investment in agriculture. In equation (32), the first term of the R.H.S. of the equation represents the marginal utility of one unit of public investment in industry

to the agricultural producers : this term is negative, whatever the level of G_i , since public investment in industry does not only reduce the amount of public funds transferable to the farmers, but it also causes a rise in the wage rate. As a result, in such an economy, the equilibrium level of public investment in industry is also sub-optimal.

The situation in which the industrial lobby is organized is very similar to the one depicted in section 3. As noted there, the two unorganized segments of the society are taxed to the maximum to finance public investment and transfers to industry. In such a situation, higher levels of public investment in the agricultural sector have, apart from the wage and the tax effects, the third effect of decreasing the relative price of food. The industry, however, may gain much more through production gains by allocating a greater G_i than through consumer gains by allocating more G_a . The equilibrium allocation of public investment may be heavily biased toward industry though the level of investment in each sector may still be sub-optimal. In fact, this scenario depicts the worst of all possible scenarios for the agricultural sectors: the level of public investment is low and thus the marginal returns on private effort is low in agriculture. Yet, the tax burden on agriculture is as high as possible which further dampens the incentives for farmers since the tax system is hardly ever non-distortionary as assumed so far in this paper. One may find here a plausible explanation for the 'urban bias' described by Lipton (1977).

Finally, when the two sectors are organized and for the very same reasons as that explained in the discussion of Proposition 3, the equilibrium level of public investment in each sector is sub-optimal. As discussed in Section 4, trade liberalization is likely to reduce the misallocation of public expenditures associated with the lobbying activities in the economy. As explained there, in a closed economy, the availability of an opportunity to manipulate relative prices is at the heart of the game played between the different sectors of the economy. But the

price distortions reduce economic efficiency and social welfare. To the extent that free trade reduces the scope for price manipulation, it may beat the political game plan of the organized sectors and thereby enhance social welfare.

6. Indirect Taxes and Private Investment

So far, we have **considered** only direct income taxes as the only tax instrument available to the State. Such an assumption was made since we wanted to abstract from the added complexity of distortions due to indirect taxes. It may however **be** argued that, in most developing countries, indirect taxes are virtually the only available tax instrument (see for instance **Tanzi (1987)**, and Krueger, Schiff and **Valdés (1991)**). If we replace the direct taxes, τ_a , τ_i and τ_l by an output tax, τ_a and τ_i , the government's budget constraint must now be written as :

$$(33) \quad G = \tau_a p_a n_a x_a + \tau_i n_i x_i$$

It is instructive to examine how a change in tax rate on agricultural output affects the welfare of various groups:

$$(34a) \quad \frac{\partial \Omega_a}{\partial \tau_a} = n_a p_a x_a \left\{ \left\{ p'_a x_a (1 - \tau_a) + p_a (1 - \tau_a) \frac{\partial x_a}{\partial G} - \ell_a w' - d_a p'_a \right\} n_a - 1 \right\},$$

$$(34b) \quad \frac{\partial \Omega_i}{\partial \tau_a} = n_i \left\{ (1 - \tau_i) \frac{\partial x_i}{\partial G} - \ell_i w' - d_a p'_a \right\} n_a p_a x_a,$$

$$(34c) \quad \frac{\partial \Omega_l}{\partial \tau_a} = n_l \left\{ \ell_l w' - d_a p'_a \right\} n_a p_a x_a, \text{ and}$$

$$(35) \quad \frac{\partial \Omega_A}{\partial \tau_a} = \left\{ n_a p'_a x_a \tau_a + n_a p_a (1 - \tau_a) \frac{\partial x_a}{\partial G} + n_i (1 - \tau_i) \frac{\partial x_i}{\partial G} \right\} p_a x_a - n_a p_a x_a.$$

We therefore obtain similar expressions than those obtained before. It can be easily **verified that Propositions (3) and (4) hold under this new set of assumptions.**

An interesting situation emerges when there is only one lobby in this economy since now direct transfers are no more allowed. Let us assume that only the industrial sector is organized and that the workers have access to a backstop technology, so as to neglect the wage effects. Then, **from** equation (34b), it comes **easily that τ_a must be higher than the optimal tax rate on the agricultural sector.**

As long as, at the social optimum G^* , $d_a n_i < \tau_a x_a n_a$, that is, as long as the fiscal revenues extracted from the agricultural sector are higher than the expenditures **made by** the industrialists on agricultural goods, then it is easy to show that $\left. \frac{\partial \Omega_i}{\partial \tau_i} \right|_{G=G^*} < 0$. As a result, the tax rate on industry is lower than the social optimum.

However, the level of public investment may be higher or lower than the social **optimum** (A similar picture emerges when one consider sector-specific investment). As mentioned in the previous section, over-taxation of agriculture has interesting disincentives effects. By lowering the marginal return to private efforts (or private investment) in agriculture, e_a , it may reduce the entrepreneurial input in agriculture. Much will depend on the degree of **complementarity** between the public good and private efforts. Indeed, the sensitivity of e_a to τ_a is given by the following expression :

$$(36) \quad \frac{de_a}{d\tau_a} = \frac{(1-\tau_a)x'_a \frac{dp_a}{dG} p_a n_a x_a - p_a x'_a e_a + (1-\tau_a)p_a \frac{\partial^2 x_a}{\partial G \partial e_a} p_a n_a x_a}{-u_z'' - (1-\tau_a)p_a x''_a e_a},$$

where the two first term of the numerator represent the two disincentive effects of **taxation on private efforts**. If the first two terms **(disincentive effect) can overwhelm the last term (output effect) in the numerator, RHS of Equation (36) will** be negative; taxing agriculture to finance public investment will discourage private effort. We would like to conjecture that the disappointing output growth **in**

agriculture observed even in situations where industry was the only organized lobby may be explained by such a strong disincentive effect.

7. Explaining The Course Of Indian Development

Our work began with the motivation to offer an explanation of the lack-lustre performance of the Indian economy during the last two decades. We believe that the framework we have presented offers some understanding of the ups and downs of the course of Indian development.

After Independence Indian planners adopted the paradigm of import substitution industrialization. The protection and promotion by the State created market rents in the industrial sector. Industrial workers organized themselves and staked claim to a share of these rents. Along with the capitalists, they became rentiers with a vested interests in protecting the rents accruing to the sector-specific factor in industry. These members of the organized sector may be considered as a part of what we have called the class of industrial **entrepreneurs**. Until the advent of the Green Revolution (1965-66), this was the only economic pressure group or lobby which had political influence of any significance. As predicted by our model, under the political process characterized by the presence of only one active lobby (industry) there was an impressive program of infrastructural development during the second and third five year plans (1955-65) but the agricultural sector, not yet organized, was heavily taxed. Although there have never been any significant income or property taxes on farmers mainly because of the difficulties in implementing an administratively feasible tax collection system, the Indian agriculture has always been heavily taxed (as in many other developing countries as demonstrated convincingly by Krueger, Schiff and Valdes (1991)). **There have been**

direct levies to feed the public distribution scheme, export taxes and inter-zonal controls. The agricultural prices have been kept lower than they would otherwise have been. Except for the selected areas earmarked for Intensive Area Development Project, this implicit taxation dampened the incentives of farmers to expend their entrepreneurial effort; private investment growth was much below its potential in Indian agriculture. Indian farmers had realized the need for organizing **themselves into a lobby as they** could see how it had benefitted the industrial workers. However, forming an effective lobby for millions of farmers spread all over the country was a herculean task. It took time. Farmers' movements had begun organizing in Western and Northern India but until the mid-seventies no effective **farmers'** lobby was yet functioning. We can view the period 1950-75 as the first stage of industrialization in the sense that it was dominated by only one pressure group -- the industrial lobby.

By the mid-seventies, farmers had succeeded in putting together a few regional organizations which were able to unite on specific policy demands. By the late seventies they had become a force to reckon with. Economic policy **was** now being made under the influence of not one but two lobbies. The unorganized sector consisted typically of labourers who were too poor to be taxed. The members of the organized sectors were well aware that they would have to pay for any public investment they wanted. They, especially farmers, would rather pay lower taxes and accept lower public investment. It takes a long time to get a tax code changed but it is quite feasible to **arrange for subsidies as a way to reduce the net tax** incidence. Subsidy demands went up quite dramatically in the late seventies and eighties. Farmers demanded: fertilizer subsidies, power subsidies, loan subsidies and water subsidies while industry ensured high incomes for its members through protection. Farmers had a good reason to feel justified in extracting subsidies since most of these **went** to partially compensate them for the higher prices they had to

pay for the industrial inputs to agriculture. In any case, farmers have seldom **agitated** for greater public investment; most of their agitations have been **for** either higher support prices or for lower input prices. The increase in subsidy bill resulted in a decline in the level of public investment but, as our model illustrates, this is what the organized sectors wanted. Unlike in the first stage there was no longer an unorganized sector available which could be taxed for financing public investment and **there** was under-allocation of public investment. The phenomenon of deceleration in growth rate is what led **Bardhan** to suggest that it was due to the decline in public investment which, in turn, was due to a rise in the demand for subsidies. In this paper, we have tried to go one step further and explain the political process responsible for this rise in subsidy demands during the last two decades. Thus, in the second stage, the poor too suffered greatly as the resources for health, education, roads as well as poverty alleviation programs became scarce.

Since 1991, the paradigm has begun to change. There is an effort to introduce reforms to liberalize the economy. An important element of this is trade liberalization. Farmers' organization in Western India (Shetkari Sanghatana) has openly welcomed trade liberalization since it would shift the terms of trade in favour of agriculture. There is a great deal of opposition to trade liberalization. Some critics have voiced concern over what these reforms would imply for the plight of the poor. There are, of course, many issues here. A legitimate concern is that the food prices may shoot up. But, on the other hand, we have shown that trade liberalization has an unexpected benefit; it can result in a higher level of public investment reversing a trend which has been calamitous to the poor in India. Since open trade policy would eliminate the price effect of public investment, it is likely to induce greater level of public investment **and increase productivity of domestic** factors.

It is interesting that 'loss of sovereignty' is one of the issues in the debate **over signing of the GATT** agreement. What is overlooked **is the fact that 'loss of sovereignty'** is a blessing in disguise as it would end the ability of sovereign lobbies to manipulate the domestic prices and in the process force the rest of the country to accept a lower level of public investment. Interestingly, such **a'loss** of sovereignty' can improve the well-being of the poor.

A byproduct of our paper is that we have suggested one answer to the question raised by Rodrik (1992): does trade liberalization really help bridge the productivity gap? Rodrik has pointed out that no compelling theoretical argument has been provided to support the belief that productivity growth would be faster **under an open economy than under a closed economy. Our model working through** the nexus of political economy and public investment presents one plausible argument.

8. Conclusions

One of the main contributions of the recent literature on political economy and rent-seeking has been to point out the extent of dead weight loss involved in activities concerned with the tug of war over shares of the national pie and the consequent diversion of resources **from** the activities concerned with increasing the size **of the** pie (e.g., Krueger (1974), Olson (1982), Becker (1983)). **In this** paper, we point out yet another channel, and we believe a significant channel, through which this process weakens the economic potential of developing countries, We point out that the formation of lobbies of producer groups can result in under-allocation of public investment and slows down development. Moreover, we point out how trade liberalization can mitigate this process.

First of all, when a producer group gets organized it can pressure the government into transferring some of the public revenues as subsidies to itself. Clearly, as long as public investment benefits other groups, a lobby would want to have the marginal **dollar** transferred to itself rather than having it go toward increasing public investment. When an economy allows lobby formation, it is visited by the well known problem of financing public goods. The solution of financing it through taxation unravels in favour of those who are in position to siphon off a part of the taxes they paid. This is what creates the spectacle of government subsidies claiming a larger and larger share of the public revenues while roads, irrigation, extension services, education and public healthsystem languish.

Secondly, public investment affects relative prices within a closed economy and brings about income transfers. Typically, in an economy with unequal distribution of income, the income growth is associated with a falling terms of trade effect for **agriculture**. This is not just a theoretical curiosum; it is a manifestation of the **Engel's** law. Farmers are conscious of it. In India, for example, the issue of terms of trade between agriculture and industry has been a major source of **debate**. "The price scissors' episode is one of the most analysed issue in the economic history of Soviet Union. (see Sah and Stiglitz(1987)). There is thus a very good reason for farmers' lobbies to be less than enthusiastic about public investment. Trade liberalization would tend to make farmers more enthusiastic about having public investment and this may be a substantial but under-appreciated advantage of trade liberalization.

These arguments, as is evident, hardly depend upon the particular framework of common agency that we have used. As long as the lobbies can influence the government policy so that their own welfare receives a greater weight in the social objective function, the results would obtain. This brings us to the

question of which policy instruments may be considered available for lobbies to manipulate. For example, why do lobbies not **oppose** trade liberalization? And **if** they could, how could we suggest it as a partial remedy for the problem of **under-**allocation of public investment? Our position on this matter is as follows: A paradigm itself is often the result of several historical factors including the march of ideas and it would be foolhardy to insist on trying to make it endogenous to economic calculation by self-interested agents. For example, the inward oriented policy adopted by the policy-makers in India could not be attributed to the manipulations of the industrial lobby ; for one thing, such a lobby had not yet formed when the paradigm was adopted. To a large extent, such a paradigm must be considered exogenous. Similarly, in the wake of the breakdown of the planned economies all over the world, a new paradigm stressing market solutions is emerging despite opposition by various producer lobbies. There is often a credible threat by foreign creditors which pushes the reform process. We conclude, therefore, that we may be justified in taking the paradigm as exogenous while taking individual policy instruments (e.g., taxes, subsidies, the level of public investment).

We should also point out that we could have added some realistic features to our model without qualitatively changing the results. For example, we could have added a term $u_g(G)$ to an individual's utility function indicating that public investment also has consumption benefits. This would strengthen our results by generating more benefits that are external to the calculations of producer groups. Similarly, for the first three propositions we do not need any special **preference** structure; even homothetic preferences would generate under-allocation of public investment. For the fourth proposition which points out how trade liberalization could partially mitigate the under-allocation problem, the only crucial characteristic about the preferences is that it is non-homothetic and incorporates the **Engel's** law.

It is possible to get the terms of trade effect with homothetic preferences; we would then need systematically different supply responses to an increase in **public** investment across the two sectors. It might be, however, interesting to model preferences in such a way that we could examine how income distribution would affect the size of the terms of trade effect and through it the extent of **under-**allocation.

To sum up, the idea we have discussed here is simple and common-sensical and yet relatively unexamined in the literature.

References

- Bardhan, P., The Political Economy of Underdevelopment in India, Oxford University Press, Oxford, 1984.
- Becker, G., "A theory of competition among Pressure Groups for Political Influence", Quarterly Journal of Economics, August 1983, 98, 371-400.
- Bernheim, B. D. and Whinston, M. D., "Menu Auctions, Resource Allocation, and Economic Influence", Quarterly Journal of Economics, February 1986, 101, 1-31.
- Binswanger, H. P., Khandker, S. R. and Rosenzweig, M. R., "How infrastructure and financial institutions affect agricultural output and investment in India", 1993, Journal of Development Economics, 41, 337-66.
- de Janvry, A. and Subbarao, K., Agricultural Price Policy and Income Distribution in India, Oxford University Press, Delhi, 1986.
- Grossman, G. and Helpman, E., "Protection for Sale", May 1992, Mimeo.
- Krueger, A., "The Political Economy of Rent-Seeking", American Economic Review, 64, no. 3, 1974.
- Krueger, A. O., Schiff, M., and Valdés, A., The Political Economy of Agricultural Pricing Policy, Vols. 4 and 5, 1991, John Hopkins U.P., Baltimore and London.
- Lipton, M., Why Poor People Stay Poor ?, 1977, Temple Smith, London.
- Long, N. V., and Vousden, N., "Protectionist Responses and Declining Industries", Journal of International Economics, February 1991, 30, 87-103.
- Newberry, D. M., "Agricultural Pricing and Public Investment", Journal of Public Economics, 1992, 47, 253-71.

Olson, M., The Rise and Decline of Nations, Yale University Press, New Haven, 1982.

Rodrik, D., "Closing the Productivity Gap: Does Trade Liberalization Really Help?", in Trade Policy Industrialization and development, edited by Gerald Helleiner, Clarendon Press, Oxford, 1992.

Sah, R. and Stiglitz, J., "Price Scissors and the Structure of ~~the~~ Economy.", Quarterly Journal of Economics, 102: 109-23, 1987.

Spiller, Pablo, "Politicians, Interest Groups, and Regulators: A Multiple-Principals Agency Theory of Regulation, or 'Let Them be Bribed'", Journal of Law and Economics, 1990, 33, 65-101.

Tanzi, V., "Quantitative aspects of the tax systems in developing countries", in: Newbery, D. and Stern, N., eds., The Theory of Taxation for Developing Countries, Clarendon Press, Oxford, 1987, 205-41.

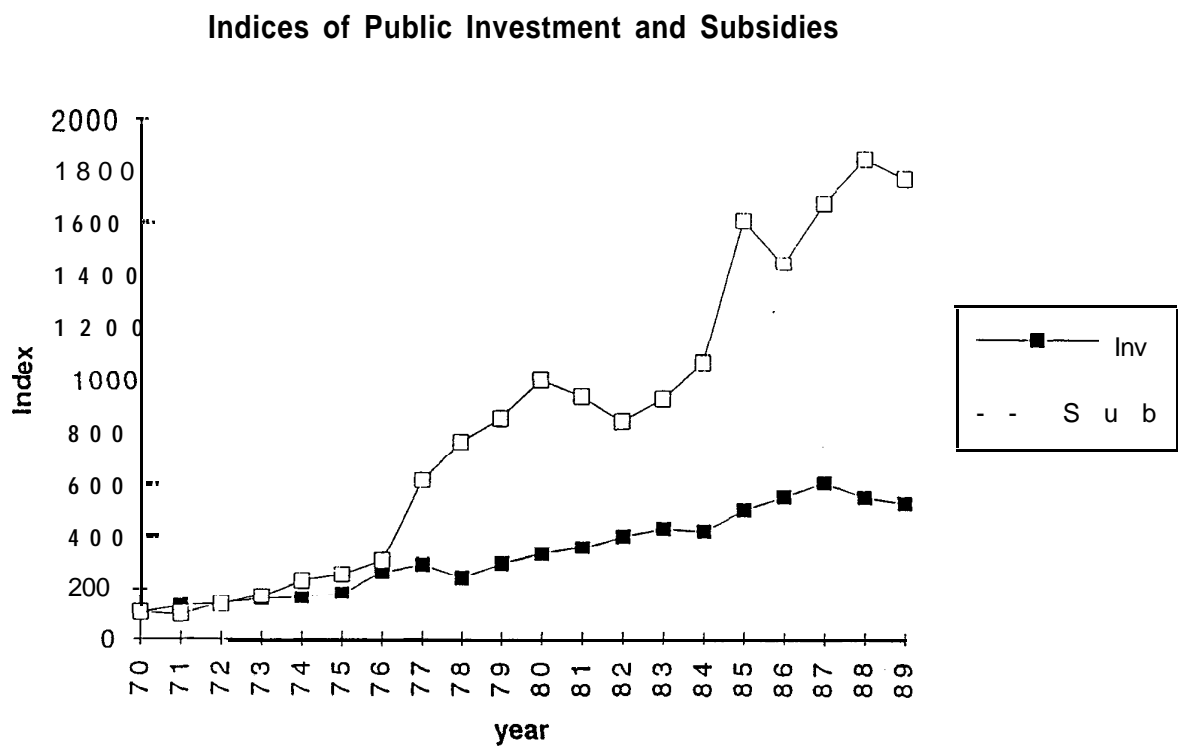


Figure 1